Copy of claims allowed

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A polymeric composition having antimicrobial properties, the polymeric composition comprising: a crosslinked chemical combination of (i) a polymer having side chains along a backbone forming the polymer, at least two of the side chains containing an amino group, (ii) an antimicrobial agent selected from the group consisting of quaternary ammonium compounds, gentian violet compounds, substituted or unsubstituted phenols, biguanide compounds, iodine compounds, and mixtures thereof, and (iii) a crosslinking agent containing at least two functional groups capable of reacting with the amino ~~groups.~~ groups; wherein the polymer is a polyamide, and the polymer is synthesized by (i) reacting a monomer selected from the group consisting of unsaturated carboxylic acids, esters of unsaturated carboxylic acids, anhydrides of unsaturated carboxylic acids, and mixtures thereof, and a first amine to form an intermediate reaction product, wherein the first amine is selected from the group consisting of RNH_2, RR_1NH, polyalkylene polyamines, and mixtures thereof, and (ii) reacting the intermediate reaction product and a second amine to form the polyamide, wherein the second amine is selected from the group consisting of R_2NH_2, R_2R_3NH, polyalkylene polyamines, and mixtures thereof, wherein R, R_1, R_2 and R_3 can be the same or different and each contain between about 1 and 50 carbon atoms and are optionally substituted with heteroatoms oxygen, nitrogen, sulfur, and phosphorus or combinations thereof; and at least one of the selected amines includes at least two amino groups.

2. (Currently Amended) The polymeric composition of claim 1 wherein ~~wherein: the polymer is a polyamide, and the polymer is synthesized by (i) reacting a monomer selected from unsaturated carboxylic acids, esters of unsaturated carboxylic acids, anhydrides of unsaturated carboxylic acids, and mixtures thereof, and a first amine to form an intermediate reaction product, wherein the first amine is selected from RR_1NH, RNH_3 $RR_1NH_2^+$, RNH_3^+ and mixtures thereof, wherein R and R1 can be the same or different and each contain between about 1 and 50 carbon atoms and are optionally substituted with heteroatoms oxygen, nitrogen, sulfur, and phosphorus and combinations thereof, and (ii) reacting the intermediate reaction product and a second amine to form the polyamide, wherein the second amine is selected from R_2R_3NH, R_2NH_2, $R_2R_3NH_2^+$, $R_2NH_3^+$ and mixtures thereof, wherein R2 and R3 can be the same or different and each contain between about 1 and 50 carbon atoms and are optionally substituted with heteroatoms oxygen, nitrogen, sulfur, and phosphorus and combinations thereof, wherein multiples of the R, R1, R2 and R3 are in vertically aligned spaced relationship along a backbone formed by the polyamide.~~ R and R_1 are alkyl.

3. (Currently Amended) The composition of claim 2 wherein ~~R and R_1 are alkyl and~~ the second amine is a polyalkylene polyamine.

4. (Currently Amended) The composition of claim 3, wherein the first amine ~~is~~ comprises tetradecylamine and the polyalkylene polyamine ~~is~~ comprises pentaethylenehexamine.

5. (Currently Amended) The composition of claim ~~2~~ 1, wherein the monomer is selected from the group consisting of unsaturated dicarboxylic acids, esters of unsaturated dicarboxylic acids, anhydrides of unsaturated dicarboxylic acids, and mixtures thereof.

6. (Currently Amended) The composition of claim 5, wherein the monomer is selected from the group consisting of maleic anhydride, maleic acid esters, and mixtures thereof.

7. (Currently Amended) The polymeric composition of claim ~~2~~ 1, wherein the antimicrobial agent is selected from the group consisting of cetyl pyridinium chloride, gentian violet, dimethyl gentian violet, dimethylchlorophenol, triclosan, thymol, chlorhexidine, iodine, and mixtures thereof.

8. – 12. (Canceled)

13. (Original) The composition of claim 1 wherein the crosslinking agent is selected from the group consisting of phosphines having the general formula $(A)_3P$, wherein A is hydroxyalkyl, and mixtures thereof.

14. (Currently Amended) The composition of claim 13 wherein the crosslinking agent ~~is~~ comprises tris(hydroxymethyl)phosphine.

15. (Canceled)

16. (Currently Amended) The composition of claim 1 wherein the antimicrobial agent ~~includes~~ comprises chlorhexidine and dimethylchlorophenol.

17. (Currently Amended) The composition of claim 1 wherein the antimicrobial agent ~~is~~ comprises dimethylchlorophenol.

18. (Currently Amended) The composition of claim ~~16~~ 1, wherein the antimicrobial agent ~~is~~ comprises triclosan.

19. (Currently Amended) The composition of claim 1 wherein the antimicrobial agent ~~is~~ comprises thymol.

20. (Currently Amended) The composition of claim 1 wherein the antimicrobial agent ~~is~~ comprises cetyl pyridinium chloride.

21. (Currently Amended) The composition of claim 1 wherein the antimicrobial agent ~~is~~ comprises gentian violet, dimethyl gentian violet, or a mixture thereof.

22. (Currently Amended) The composition of claim 1 wherein the antimicrobial agent ~~is~~ comprises chlorhexidine.

23. (Currently Amended) The composition of claim 1 wherein the antimicrobial agent ~~is~~ comprises iodine, an iodine complex, or a mixture thereof.

24. – 47. (Canceled)

48. (Currently Amended) A process for rendering the surface of a substrate antimicrobial, the process comprising:

(a) providing a polymer having side chains along a backbone forming the polymer, at least two of the side chains containing an amino group; wherein the polymer is a polyamide, and the polyamide is synthesized by:

(i) reacting a monomer selected from the group consisting of unsaturated carboxylic acids, esters of unsaturated carboxylic acids, anhydrides of unsaturated carboxylic acids, and mixtures thereof, and a first amine to form an intermediate reaction product, wherein the first amine is selected from the group consisting of RNH_2, RR_1NH, polyalkylene polyamines and mixtures thereof, and

(ii) reacting the intermediate reaction product and a second amine to form the polyamide, wherein the second amine is selected from the group consisting of R_2NH_2, R_2R_3NH, polyalkylene polyamines and mixtures thereof, wherein R, R_1, R_2 and R_3 can be the same or different and each contain between about 1 and 50 carbon atoms and are optionally substituted with heteroatoms oxygen, nitrogen, sulfur, and phosphorus or combinations thereof; and at least one of the selected amines includes at least two amino groups;

(b) mixing the polymer with a crosslinking agent and an antimicrobial agent selected from the group consisting of quaternary ammonium compounds, gentian violet compounds, substituted or unsubstituted phenols, biguanide compounds, iodine compounds, and mixtures thereof, to produce a polymer solution, the crosslinking agent containing at least two crosslinking functional groups capable of reacting with the amino groups; and

(c) coating at least a portion of the substrate with the polymer solution to produce a crosslinked polymer coating on the substrate.

49. (Currently Amended) The process of claim 48 wherein ~~wherein:~~ the crosslinking agent is selected from the group consisting of polyaldehydes, phosphines having the general formula $(A)_3P$, wherein A is hydroxyalkyl, and mixtures thereof.

50. (Currently Amended) The process of claim 48 wherein ~~wherein:~~ the crosslinking agent is selected from the group consisting of phosphines having the general formula $(A)_3P$, wherein A is hydroxyalkyl, and mixtures thereof.

51. (Currently Amended) The process of claim 48 wherein the substrate comprises a polymeric material selected from the group consisting of polyolefins, polyacrylics, polyvinyl chloride, polyamides, polyurethanes, polyurethaneureas, silicone urethane copolymers, polyvinylpyrrolidone, polyvinyl alcohols, cellulosic materials, polystyrene, polyesters, fluorinated polymers, silicone polymers, natural rubber, polycarbonates, and mixtures thereof.

52. (Currently Amended) The process of claim 48 wherein the antimicrobial agent is selected from the group consisting of cetyl pyridinium chloride, gentian violet, dimethyl gentian violet, dimethylchlorophenol, triclosan, thymol, chlorhexidine, iodine, and mixtures thereof.

53. (Currently Amended) The process of claim 48 wherein ~~wherein: the polymer is a polyamide, and step (a) comprises: (i) reacting a monomer selected from unsaturated carboxylic acids, esters of unsaturated carboxylic acids, anhydrides of unsaturated carboxylic acids, and mixtures thereof, and a first amine to form an intermediate reaction product, wherein the first amine is selected from RR_1NH, RNH_2 $RR_1NH_2^+$, RNH_3^+ and mixtures thereof, wherein R and R1 can be the same or different and each contain between about 1 and 50 carbon atoms and are optionally substituted with heteroatoms~~ oxygen, nitrogen, sulfur, and ~~phosphorus and combinations thereof, and (ii) reacting the intermediate reaction product and a second amine to form the polyamide, wherein the second amine is selected from R_2R_3NH, R_2NH_2, $R_2R_3NH_2^+$, $R_2NH_3^+$ and mixtures thereof, wherein R2 and R3 can be the same or different and each contain between about 1 and 50 carbon atoms and are optionally substituted with heteroatoms oxygen, nitrogen, sulfur, and phosphorus and combinations thereof, wherein multiples of the R, R1, R2 and R3 are in vertically aligned spaced relationship along a backbone formed by the polyamide.~~ R and R_1 are alkyl.

54. (Currently Amended) The process of claim 53 wherein ~~R and R1 are alkyl and~~ the second amine is a polyalkylene polyamine.

55. (Currently Amended) The process of claim ~~53~~ 48, wherein the monomer is selected from the group consisting of maleic anhydride, maleic acid ~~esters.~~ esters, and mixtures thereof.

56. (Currently Amended) The process of claim 54, wherein the first amine comprises tetradecylamine and the polyalkylene polyamine comprises pentaethylenehexamine. ~~53 wherein the antimicrobial agent is selected from cetyl pyridinium chloride, gentian violet, dimethyl gentian violet, dimethylchlorophenol, triclosan, thymol, chlorhexidine, iodine, and mixtures thereof.~~

57. – 59. (Canceled)

60. (New) A polyamide material formed from:

(A) a polyamide formed from a mixture which comprises:

one or more monomers selected from the group consisting of unsaturated carboxylic acids, esters of unsaturated carboxylic acids, anhydrides of unsaturated carboxylic acids, and mixtures thereof, and one or more amines selected from the group consisting of polyalkylene polyamines and amines having the formula RNH_2 or RR_1NH, wherein R and R_1 contain between 1 and 50 carbon atoms and are optionally substituted with heteroatoms oxygen, nitrogen, sulfer, phosphorus, and combinations thereof, and wherein at least one of the selected amines includes at least two amino groups; and

(B) an antimicrobial agent comprising an agent selected from the group consisting of quaternary ammonium compounds, gentian violet compounds, substituted or unsubstituted phenols, biguanide compounds, iodine compounds, and mixtures thereof;

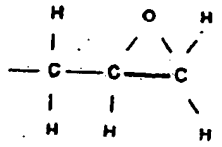
(C) a crosslinking agent containing at least two functional groups capable of reacting with amino groups.

61. (New) The polyamide material of claim 60, wherein the crosslinking agent comprises a phosphine having the general formula $(A)_3P$, wherein A is hydroxyalkyl.

62. (New) The polyamide material of claim 61, wherein the crosslinking agent comprises tris(hydroxymethyl)phosphine.

63. (New) The polyamide material of claim 60, wherein the crosslinking agent comprises gluteraldehyde and tris(hydroxymethyl)phosphine.

64. (New) The polyamide material of claim 60, wherein the crosslinking agent comprises an agent selected from the group consisting of aliphatic isocyanate compounds having 2 or more –N=C=O groups; aromatic isocyanate compounds having 2 or more –N=C=O groups; aromatic aldehyde compounds having 2 or more –CHO groups; phosphines having the general formula $(A)_2P(B)$ wherein A is hydroxyalkyl, and B is hydroxyalkyl, alkyl, or aryl; epoxy resins having end groups of the formula:



and mixtures thereof.

65. (New) The polyamide material of claim 60, wherein the antimicrobial agent comprises an agent selected from the group consisting of cetyl pyridinium chloride, gentian violet, dimethyl gentian violet, dimethylchlorophenol, triclosan, thymol, chlorhexidine, iodine, and mixtures thereof.

66. (New) The polyamide material of claim 60, wherein the one or more monomers are selected from the group consisting of maleic anhydride, maleic acid esters, and mixtures thereof.

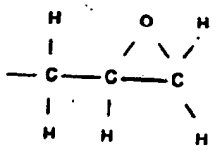
67. (New) The polyamide material of claim 60, wherein the one or more monomers are selected from the group consisting of unsaturated dicarboxylic acids, esters of unsaturated dicarboxylic acids, and anhydrides of unsaturated dicarboxylic acids and mixtures thereof.

68. (New) The polyamide material of claim 60, wherein the one or more amines comprise tetradecylamine.

69. (New) The polyamide material of claim 60, wherein the one or more amines comprise pentaethylenehexamine.

70. (New) The polyamide material of claim 60, wherein the one or more amines comprise polyalkylene polyamine and an amine having the formula RNH_2, wherein R is alkyl.

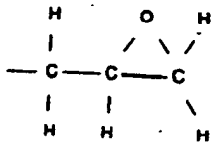
71. (New) The polymeric composition of claim 1 wherein the crosslinking agent is selected from the group consisting of aliphatic isocyanate compounds having 2 or more –N=C=O groups; aromatic isocyanate compounds having 2 or more –N=C=O groups; aromatic aldehyde compounds having 2 or more –CHO groups; phosphines having the general formula $(A)_2P(B)$ wherein A is hydroxyalkyl, and B is hydroxyalkyl, alkyl, or aryl; epoxy resins having end groups of the formula:



and mixtures thereof.

72. (New) The polymeric composition of claim 1, wherein the crosslinking agent comprises gluteraldehyde and tris(hydroxymethyl)phosphine.

73. (New) The process of claim 48, wherein the crosslinking agent is selected from the group consisting of aliphatic isocyanate compounds having 2 or more –N=C=O groups; aromatic isocyanate compounds having 2 or more –N=C=O groups; aromatic aldehyde compounds having 2 or more –CHO groups; phosphines having the general formula $(A)_2P(B)$ wherein A is hydroxyalkyl, and B is hydroxyalkyl, alkyl, or aryl; epoxy resins having end groups of the formula:



and mixtures thereof.

74. (New) The process of claim 48, wherein the monomer is selected from the group consisting of unsaturated dicarboxylic acids, esters of unsaturated dicarboxylic acids, anhydrides of unsaturated dicarboxylic acids, and mixtures thereof.

75. (New) The process of claim 48, wherein the monomer is selected from the group consisting of maleic anhydride, maleic acid esters, and mixtures thereof.

76. (New) The process of claim 48, wherein the crosslinking agent comprises gluteraldehyde and tris(hydroxymethyl)phosphine.

77. (New) A polymeric material comprising:

(A) a polymer formed by a process comprising:

reacting a reaction mixture comprising a monomer selected from the group consisting of unsaturated carboxylic acids, esters of unsaturated carboxylic acids, anhydrides of unsaturated carboxylic acids, and mixtures thereof; and one or more amines selected from polyalkylene polyamines and amines having the formula RNH_2 or RR_1NH, wherein R and R_1 contain between 1 and 50 carbon atoms and are optionally substituted with heteroatoms oxygen, nitrogen, sulfur, phosphorus, and combinations thereof, wherein the selected amine includes at least one amine having at least two amino groups; and

(B) an antimicrobial agent comprising an agent selected from the group consisting of quaternary ammonium compounds, gentian violet compounds, substituted or unsubstituted phenols, biguanide compounds, iodine compounds, and mixtures thereof.

78. (New) The polymeric material of claim 77, wherein the monomer is selected from the group consisting of unsaturated dicarboxylic acids, esters of unsaturated dicarboxylic acids, anhydrides of unsaturated dicarboxylic acids, and mixtures thereof.

79. (New) The polymeric material of claim 78, wherein the monomer is selected from the group consisting of maleic anhydride, maleic acid esters, and mixtures thereof.

80. (New) The polymeric material of claim 79 wherein the antimicrobial agent is selected from the group consisting of cetyl pyridinium chloride, gentian violet, dimethyl gentian violet, dimethylchlorophenol, triclosan, thymol, chlorhexidine, iodine, and mixtures thereof.

81. (New) The polymeric material of claim 77, wherein R and R_1 are alkyl.

82. (New) The polymeric material of claim 77, wherein one or more selected amines comprises a polyalkylene polyamine.

83. (New) The polymeric material of claim 77, wherein RNH_2 comprises tetradecylamine and the polyalkylene polyamine comprises pentaethylenehexamine.

84. (New) The polyamide material of claim 77, wherein the one or more amines comprise polyalkylene polyamine and an amine having the formula RNH_2, wherein R is alkyl.